DATE: August 11, 2008

TO: Office of Drinking Water Technical Staff

FROM: J. Wesley Kleene, Ph.D., P.E., Director
Office of Drinking Water

SUBJECT: SURVEILLANCE & REGULATIONS – LCR Short Term Revisions and Clarifications

RELATED: WM 740 (Technical Assistance Lead and Copper Rule Desktop Evaluations),
WM 808 (Lead and Copper Rule – Operational Control Monitoring),
WM 898 (Compliance Sampling and Reporting)

BACKGROUND:

The Lead and Copper Rule Short Term Revisions and Clarifications represent the second major revision / addition to the original Lead and Copper Rule. The original Lead and Copper Rule (LCR) was promulgated on June 7, 1991, and the Lead and Copper Rule Minor Revisions (LCRMR) were promulgated on January 12, 2000. These most recent additions to the LCR, Lead and Copper Rule Short Term Revisions and Clarifications (LCR STR), were published in the Federal Register on October 10, 2007 and had an effective date of December 10, 2007. The compliance date for states that adopt EPA rules "by reference" is April 8, 2008. The compliance date for states that must go through a more formal rule adoption process (like Virginia) is April 8, 2010. As we have done with previous EPA rules, the ODW will proceed with implementation of this new LCR STR during the interim formal adoption process. This memo provides implementation guidance to the ODW staff.

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I. SUMMARY AND INTRODUCTION:

The LCR STR includes six major elements. These include:

1. Monitoring revisions that clarify:
   - Minimum Number of Samples Required
   - Definitions for Compliance and Monitoring Periods
   - Reduced Monitoring Criteria
2. Consumer notification of lead tap sampling results
3. Consumer Confidence Report mandatory language
4. Notification and approval of treatment and source changes
5. Public Education changes
6. Re-evaluation of tested out lead service lines

II. IMPLEMENTATION

**1. Monitoring Revisions and Clarifications:**

**Minimum Number of Samples Required** - The original LCR required small waterworks to collect lead and copper tap samples from a minimum of five sites. Some very small waterworks do not have five available taps from which to sample, so many states (including Virginia) allowed these waterworks to collect samples from all available sites. As such some small waterworks were not collecting the minimum number of samples.

The LCR STR clarifies that all waterworks must collect at least five lead and copper tap samples. If fewer than five sample taps are available, all taps must be sampled at least once and repeat sampling conducted at some taps until the minimum number of samples are collected. Additional samples collected from repeat tap locations should be collected on separate days. Additionally, the rule includes a requirement that only taps used for human consumption (such as kitchen and bathroom taps as opposed to hose bibbs and utility sinks) are to be utilized for lead and copper monitoring. At NTNC waterworks, drinking fountains will be considered to be acceptable sample taps for lead and copper monitoring.

The LCR STR includes a provision giving States the option to allow fewer than five samples to be collected at very small waterworks. Waterworks collecting fewer than five samples must collect a sample from all acceptable sample taps and use the highest single lead and copper result as the $90^{th}$ percentile concentration to be compared to the Action Levels.

The ODW policy will be to allow this option for the very small waterworks. If a small waterworks chooses to collect fewer than five samples, District Engineer must ensure that:

- The LCR Monitoring Plan is revised to clearly specify the number of samples to be collected and the specific sampling locations
- ALL sample taps used for human consumption are sampled at the waterworks
- The owner is aware that the single highest sample result will be compared to the respective Action Level, and
- That this option is approved in writing prior to sampling.

The District Engineer must ensure that the minimum number of samples are collected from all waterworks and that only acceptable sample taps are used for lead and copper sampling. Modification of previously approved lead and copper sampling plans may be necessary.

See Monitoring Example Number 1.

**Clarification of definitions for compliance period and monitoring period** – Waterworks in reduced monitoring are required to complete lead and copper monitoring either once during each calendar year or once during each three-year compliance period with all samples collected during a four month monitoring period (usually June through September). Under the original LCR language, it is unclear when a waterworks has been determined to have exceeded an Action Level and subsequently the exact deadlines for completing the treatment technique requirements (corrosion control treatment, source water treatment, public education, and lead service line replacement) – i.e., are the treatment technique deadlines calculated from the end of the monitoring period (September) or from the end of the compliance period (December)? The LCR STR clarifies that a waterworks in reduced monitoring is determined to have exceeded an Action Level as of the end of the monitoring period (September).

This means that the timing of all required actions is calculated as of the end of September for a waterworks in reduced monitoring.

The LCR STR further clarifies that waterworks on triennial reduced monitoring must monitor for lead and copper at least once every three calendar years. Waterworks are not allowed to monitor during year 1 in the first compliance period and during year 3 of the second compliance period (i.e., five years between lead and copper monitoring events). Samples also have to be collected during four consecutive months and not spread out over multiple years.

The District Engineer must ensure that all waterworks in triennial reduced monitoring collect lead and copper sampling at least every three calendar years. Additionally, all required actions associated with an Action Level exceedance must be calculated from the end of the four month monitoring period (September 30, 2xxx for most waterworks).

See Monitoring Example Number 2.

**Changes to reduced monitoring requirements** – Under the LCR, States must establish water quality parameters (WQP's) that define optimum corrosion control treatment for all large waterworks (serving > 50,000 population) and for small and medium waterworks that install corrosion control treatment but continue to exceed the lead or copper Action Level. Once WQP's have been established, compliance with the LCR is based upon the WQP monitoring. Hence it was possible that a waterworks could exceed an Action Level but meet the established WQP's and remain in or initiate reduced monitoring.

The LCR STR clarifies this situation and requires that a waterworks can only initiate or remain in reduced monitoring if the lead Action Level is met. The LCR STR states:

*A small or medium-size water system that meets the lead and copper action levels during three consecutive years of monitoring may reduce the frequency of monitoring for lead and copper from annually to once every three years. Any water system that meets the lead action level and maintains the range of values for the water quality control parameters reflecting optimal corrosion control treatment specified by the State during three consecutive years of monitoring may reduce the frequency of monitoring from annually to once every three years if it receives written approval from the State.*

The District Engineer must ensure that any waterworks can only proceed to or remain in reduced monitoring if the 90$^{th}$ percentile concentration for lead is below the established 15 ppb Action Level.

2. **Consumer notification of lead and copper tap sampling results -** There are currently no provisions in the LCR or the LCRMR that require a waterworks owner to provide monitoring results to the occupants of the individual tested sites. The LCR STR adds to the existing Public Education requirements and mandates that all waterworks (Community and NTNC) must provide written notification to the occupants of the tested buildings within 30 days after learning the results of tap monitoring. NTNC waterworks are allowed to post the monitoring results if approved by the State. This notification must include the following elements:

    - Result of lead and copper tap monitoring
    - Explanation of the health effects of lead
    - List steps consumers may take to reduce lead exposure from drinking water
    - Provide contact information for the utility
    - Include the lead MCLG and Action Level and what these levels mean

Note that the current Public Education treatment technique is required only when the lead Action Level is exceeded. This consumer notification is required following each lead and copper monitoring event – regardless of the lead 90th percentile concentrations. Note that while this new requirement is included in the Lead and Copper Public Education section, this consumer notification is different and a separate requirement from Public Education.

The District Engineer must ensure that the lead and copper monitoring results notification letter sent to waterworks owners is modified to include this new requirement. Because most waterworks will not be aware of this consumer notice requirement, we will consider the 30 day timeframe to begin from the date of our lead and copper sample result notification letter. As such, District Engineers must ensure that lead and copper sample results are processed in a timely manner and the waterworks owners notified of the sample results and of the consumer notification requirement. The expectation is that this notification be provided within 10 days of receiving the last lead and copper sample result.

In addition, the waterworks owner is required to submit a completion statement/form to the respective Field Office within 3 months following the end of the monitoring period certifying that consumer notification was completed in accordance with the LCR STR.

Failure to complete this required consumer notification is a violation. This is a NEW Lead and Copper Rule violation. The type code is 66 and this is an M/R violation (not a TT violation like failure to complete Public Education).

Example letters and Consumer Notification templates are posted at Y:/ 03-Memos/301-Active Working Memos/301.02 Forms Letters Manuals/.

3. **Consumer Confidence Report mandatory language –** The LCR STR requires that mandatory language regarding lead in drinking water be included in every Consumer Confidence Report. This CCR language must include a statement about lead in drinking water and the health effects on children. In addition, the language must include a tap flushing recommendation of 15 to 30 seconds. This new CCR statement is required even if no lead is detected in LCR monitoring results.

   EPA has suggested that Virginia include the revised CCR language of the LCR STR into our Stage 2/Long Term 2 regulations that are currently being incorporated into the *Waterworks Regulations*. As such, the CCR portion of the LCR STR will be in effect at the same time as the Stage 2/Long Term 2 regulations.

   District Engineers must ensure that this mandatory Lead and Copper language is included in all Consumer Confidence Reports beginning with the 2008 CCR's (to be distributed in 2009).

   Consumer Confidence Report mandatory language is posted at Y:/ 03-Memos/301-Active Working Memos/301.02 Forms Letters Manuals/.

4. **Advanced notification and approval of any change in water treatment or addition of a new water source** – This change requires that waterworks owners notify and gain approval from the States prior to making any changes in water treatment or adding a new water source. This is a direct result of the Washington D.C. events where a change from free chlorine disinfection to chloramines resulted in increased distribution system lead levels. Additionally, the States, in granting approvals, must make an assessment as to whether the addition of a new water source or a change in water treatment will adversely affect optimal corrosion control treatment and result in an increase in distribution system lead or copper levels. Our assessment may result in requiring

optimal corrosion control studies to be conducted prior to implementing a long term treatment change or adding a new source and/or requiring that additional lead and copper monitoring be conducted

The Virginia *Waterworks Regulations* already require waterworks owners to obtain a Construction Permit for any changes in treatment or the addition of a new water source. As such we should be notified of significant treatment changes or new sources.

***12 VAC 5-590-190. Permits.***

*No owner or other person shall cause or allow the construction or change in the manner of transmission, storage, purification, treatment, or distribution of water (including the extension of water pipes for the distribution of water) at any waterworks or water supply without a written construction permit from the commissioner.*

The potential for a new water source or long-term changes in treatment to impact corrosion control treatment and distribution system lead levels should be addressed in the preliminary engineering conference and/or preliminary engineering report.

**Long-term treatment changes:**

Long-term treatment changes do not include chemical dose fluctuations associated with daily raw water quality changes or normal seasonal changes. The LCR STR guidance gives specific examples of long-term changes in treatment. These include:

- Changing disinfectants such as chlorine to chloramines
- Changing primary coagulants such as alum to ferric chloride
- Changing corrosion inhibitor chemicals such as orthophosphate to a blended phosphate
- Making a change in dose of an existing chemical if the system is planning long-term changes to its finished water pH or residual inhibitor concentration

Additional examples of long-term treatment changes include the installation of major unit processes such as membrane filtration, ozonation, enhanced coagulation/enhanced softening to reduce disinfectant by-product precursors, and other treatments or processes or combinations of processes that can greatly affect the pH, oxidation-reduction potential, alkalinity, or the major composition of the ionic background of the water.

The ODW's policy is to evaluate treatment changes on a case-by-case basis to determine if the waterworks must conduct optimum corrosion control studies and/or additional lead and copper tap monitoring. The District Engineer must continue to make this evaluation. The decision to require the waterworks to conduct a corrosion control study or to conduct additional monitoring must be made in consultation with the Division of Technical Services staff in the Central Office.

Note that if the waterworks is changing the method of corrosion control treatment, we need to require that the waterworks return to "follow-up monitoring" (monitoring for two consecutive six months monitoring at the original number of tap sample sites). See *Waterworks Regulations* 12VAC5-590-370 B 6 a (4) (b). Examples would include changing from pH adjustment to a corrosion inhibitor or a change in corrosion inhibitors – such as changing from a zinc orthophosphate to a blended phosphate. For other treatment changes, if there is any question regarding the potential impacts on distribution system lead or copper levels, the OCCT study and/or additional lead and copper tap sampling should be required. If additional monitoring is deemed necessary, the waterworks will be required to collect lead and copper tap samples from approved sites for two consecutive 6-month periods. The number of samples to be collected will

be determined by the District Engineer and will usually be the number of original lead and copper monitoring sites (See *Waterworks Regulations* 12VAC5-590-370 B 6 a (4) (d) (viii)). Sampling during the July – December period should be collected during July or August to capture the worst case warmer months.

**Addition of a new water source:**

Just as with a long-term treatment change, the LCR-STR requires states to approve the addition of new water sources and to make an assessment as to whether the new water source will adversely affect optimal corrosion control treatment and/or result in an increase in distribution system lead or copper levels. The ODW's policy is to evaluate the addition of new water sources on a case-by-case basis to determine if the waterworks must conduct optimum corrosion control studies and/or additional lead and copper tap monitoring. The District Engineer must continue to make this evaluation. The decision to require the waterworks to conduct a corrosion control study or additional monitoring must be made in consultation with the Division of Technical Services staff in the Central Office.

We should require the corrosion control study or additional monitoring when the new water source is significantly different in water quality characteristics that may impact corrosion. If a waterworks using wells decides to add an additional well source, and the new well has similar water quality to the existing wells, it would not be necessary to conduct a corrosion control study or additional monitoring. However, if the new well is significantly different in water quality then the OCCT or additional monitoring should be required. If a waterworks using wells decides to add a surface water source and abandon the wells, then we must require the corrosion control study and/or additional monitoring (based upon both the different, new water source and the addition of new treatment for the surface water source).

In most situations where we determine that the new water source may adversely affect optimal corrosion control treatment and/or result in an increase in distribution system lead or copper levels we will require additional lead and copper tap monitoring as described for long-term treatment changes.

EPA has developed guidance to assist States in making decisions related to the impact on lead corrosion resulting from the addition of a new water source or a long-term treatment change. See Appendix D of the "**Simultaneous Compliance Guidance Manual for the Long Term 2 and Stage 2 DBP Rules"** March 2007. This document can be accessed from the following EPA web site:

http://www.epa.gov/safewater/disinfection/stage2/pdfs/guide_st2_pws_simultaneous-compliance.pdf

See Monitoring Example Number 6

5. **Public Education** – Waterworks that exceed the lead Action Level are required to initiate the Public Education treatment technique. The LCR STR makes significant changes in the content of Public Education written materials, delivery requirements, and the timing of when systems must complete all required activities.

   The District Engineer must ensure that the transmittal letter for all waterworks that exceed the lead Action Level includes the Public Education requirement. At least in the initial stages of implementation, significant additional technical assistance will likely be needed to ensure compliance.

The LCR-STR requires the owners of community waterworks to contact the local health department and request assistance in notification to organizations that serve "at risk" populations (children and pregnant women). The District Engineer must contact the District Medical Director to alert the LHD of this requirement and provide assistance in determining the extent of this required organization notification. There are two notification scenarios, one for notification to the District Medical Director prior to any Action Level exceedance, and a second for notification when (if) a waterworks exceeds an Action Level in a respective district. The District Engineer can decide which type of notification is appropriate to use.

PE content and delivery requirements, templates, example letters to the District Medical Director and additional guidance are posted at Y:/ 03-Memos/301-Active Working Memos/301.02 Forms Letters Manuals/.

6. **Re-evaluation of lead service lines deemed replaced through testing** – Under the original LCR, waterworks that exceed the lead Action Level after installing corrosion control treatment must initiate a lead service line replacement program (if lead service lines are present). For a waterworks triggered into lead service line replacement, the LCR allows the waterworks to test the individual lead service line to possibly avoid replacement. If the test results from the lead service line are below the 0.015 mg/L lead Action Level, the service line does not require replacement. The LCR STR requires waterworks to re-evaluate these lead service lines that were not replaced if they are required to "resume" lead service line replacement. This change only applies to a waterworks that was triggered into lead service line replacement, and then discontinued the program based on lead and copper tap sample results, and then subsequently is required to resume lead service line replacement.

   There are currently no waterworks in Virginia that have been required under the LCR to replace lead service lines.

## III. ADDITIONAL RESOURCES AND GUIDANCE

The following resource and guidance documents are posted in the Lead and Copper folder on ODWSHARE. See Y:\02-Committees\202-Rule Teams\Lead and Copper Rule\LCR STR October 2007

Implementation Guidance.pdf
Implementation Guidance Appendix A.pdf
Implementation Guidance Appendix B.pdf
PE Guidance Manual for CWS.pdf
PE Guidance Manual for NTNCWS.pdf

Additional resources are posted in the Y:/ 03-Memos/301-Active Working Memos/301.02 Forms Letters Manuals/. These include Public Education templates for both community and NTNC waterworks, Consumer Confidence Report mandatory language, Consumer Notification templates for community and NTNC waterworks and several example letters for various lead and copper monitoring situations.

## LCR Monitoring and 90th Percentile Determination Examples

### LCR Monitoring Example 1: Very Small Waterworks

Anydaycare facility is a NTNC waterworks serving 30 preschool children and 4 staff members. The daycare is located in a small three room building. Available sampling taps include two restrooms, a sink in a kitchen area, a water fountain, a sink in a janitor's closet and two outside hose bibbs. Because the population served is less than 100, a minimum of five (5) lead and copper samples must be collected during all monitoring periods.

Under the LCR STR, this waterworks has only four acceptable sample taps for lead and copper sampling. These acceptable locations are the cold water taps in the two restrooms, the water fountain and the cold water tap at the kitchen sink. The outside hose bibbs and the janitor's closet sink are not acceptable sample locations because these taps are not "normally" used for human consumption.

In order to satisfy the monitoring requirements of the LCR STR, the Anydaycare owner/operator must initially collect four lead and copper samples, one each from the cold water taps in the two restrooms, one from the water fountain, and a fourth from the cold water tap at the kitchen sink on one day. On a separate day, the owner / operator must collect one additional sample from any of the four acceptable sample locations. The 90th percentile concentrations are calculated by averaging the 4th and 5th highest lead and copper sample results.

The District Engineer may allow the Anydaycare facility to only collect four samples for lead and copper monitoring. If this is allowed, approval to collect lead and copper tap samples from less than five sample locations must be approved in writing prior to any sample collection. Under this scenario, one sample must be collected from each of the four acceptable sample taps. Upon receipt of the monitoring results, the single highest sample result is compared to the respective lead and copper Action Level.

## LCR Monitoring Example 2: Community Waterworks in Triennial Reduced Monitoring

Anytown is a community waterworks serving a total population of 3,800 persons. This waterworks is currently in triennial reduced monitoring and is required to submit a total of 20 lead and copper samples. The Field Office receives the results of 14 lead and copper sample results on July 25, 2009. These 14 samples were collected on July 3, 2009. The Field Office receives the results of 10 additional samples on October 10, 2009. These 10 samples were collected on October 2, 2009.

The District Engineer reviews the results of the 24 lead and copper samples and must determine the 90$^{th}$ percentile concentrations. The results are noted below:

### Anytown Waterworks – Lead and Copper Sampling Results

| Sample Collection Date | Lead Result (ppb) | Copper Results (mg/L) |
|---|---|---|
| July 3, 2009 | < 5 | 0.34 |
| July 3, 2009 | 7.3 | 0.5 |
| July 3, 2009 | 8.6 | 0.5 |
| July 3, 2009 | < 5 | 0.5 |
| July 3, 2009 | < 5 | 0.73 |
| July 3, 2009 | 13 | 0.55 |
| July 3, 2009 | 9 | 1.1 |
| July 3, 2009 | < 5 | 0.22 |
| July 3, 2009 | 25 | 1.0 |
| July 3, 2009 | 14 | 0.33 |
| July 3, 2009 | < 5 | 0.33 |
| July 3, 2009 | < 5 | 1.9 |
| July 3, 2009 | < 5 | 0.89 |
| July 3, 2009 | 6 | 0.79 |
| October 2, 2009 | 6 | 0.5 |
| October 2, 2009 | 10 | 0.5 |
| October 2, 2009 | 6 | 1.0 |
| October 2, 2009 | 12 | 0.3 |
| October 2, 2009 | < 5 | 0.88 |
| October 2, 2009 | < 5 | 0.54 |
| October 2, 2009 | < 5 | 0.6 |
| October 2, 2009 | < 5 | 0.2 |
| October 2, 2009 | 10 | 0.11 |
| October 2, 2009 | 8 | 0.71 |

The following actions are required for this sample set:

I The 90$^{th}$ percentile lead and copper concentrations must be calculated. Only the 14 samples that were collected during the June through September 2009 monitoring period can be used to calculate the 90$^{th}$ percentile concentrations. The samples collected in October are not valid samples and are NOT to be included in the 90$^{th}$ percentile calculation. See Y:\02-Committees\202-Rule Teams\Lead and Copper Rule\LCRMR January 2000/ *EPA Memo Sampling Requirements 11_23_2004.pdf* and *EPA Memo 90th Compliance Calculations 03_09_2004.pdf.*
The 14 valid samples collected in July 2009 are used to calculate the 90$^{th}$ percentile concentrations. The lead 90$^{th}$ percentile concentration is calculated as follows:

Place both the 14 lead sample results and the 14 copper sample results in ascending order.

| Sample Collection Date | Ascending Lead Sample Number | Lead Result (ppb) | Ascending Copper Sample Number | Copper Results (mg/L) |
|---|---|---|---|---|
| July 3, 2009 | 1 | < 5 | 1 | 0.22 |
| July 3, 2009 | 2 | < 5 | 2 | 0.33 |
| July 3, 2009 | 3 | < 5 | 3 | 0.33 |
| July 3, 2009 | 4 | < 5 | 4 | 0.34 |
| July 3, 2009 | 5 | < 5 | 5 | 0.5 |
| July 3, 2009 | 6 | < 5 | 6 | 0.5 |
| July 3, 2009 | 7 | < 5 | 7 | 0.5 |
| July 3, 2009 | 8 | 6 | 8 | 0.55 |
| July 3, 2009 | 9 | 7.3 | 9 | 0.73 |
| July 3, 2009 | 10 | 8.6 | 10 | 0.79 |
| July 3, 2009 | 11 | 9 | 11 | 0.89 |
| July 3, 2009 | 12 | 13 | 12 | 1.0 |
| July 3, 2009 | 13 | 14 | 13 | 1.1 |
| July 3, 2009 | 14 | 25 | 14 | 1.9 |

The 90$^{th}$ percentile lead concentration is the 12.6th (14 x 0.9 = 12.6) sample result. EPA Guidance allows either rounding or interpolation to determine the 90$^{th}$ percentile concentration when the sample that represents the 90$^{th}$ percentile value is not a whole number.

**Using Rounding:** To determine the 90th percentile level, using rounding, you would:

1. Round down to the nearest whole number if the decimal is 0.4 or lower
2. Round up to the nearest whole number if the decimal is 0.5 or higher

In this example, the 90$^{th}$ percentile sample is 12.6, so you would round up to 13. The sample result that is ranked 13$^{th}$ in the list represents the 90$^{th}$ percentile lead concentration and this value is compared to the 15 ppb lead Action Level.

Using rounding, the 90$^{th}$ percentile concentration is 14 ppb which is below the lead action level of 15 ppb.

**Using Interpolation**: To determine the 90th percentile level, using interpolation, you would:

1 Subtract the difference between the two samples between which your 90$^{th}$ percentile falls. In this example, you subtract the 12$^{th}$ sample result of 13 ppb from the 13$^{th}$ sample result of 14 ppb, for a difference of 1 ppb.

2 Multiply the difference of 1 ppb by 0.6 because the 90$^{th}$ percentile level is 0.6 higher than the 12$^{th}$ sample: 1 ppb x 0.6 = 0.6 ppb

3 Add 0.6 ppb to the lower of the two sample results, in this example to the 12$^{th}$ sample result of 13 ppb (13 + 0.6 = 13.6 ppb)

Using interpolation, the 90th percentile lead level is 13.6 ppb which is below the lead action level of 15 ppb**.**

The same procedure would be utilized to determine the copper 90$^{th}$ percentile concentration.

Using rounding, the copper 90$^{th}$ percentile concentration is: 1.1 mg/L
Using interpolation, the copper 90$^{th}$ percentile concentration is: 1.06 mg/L

II The Anytown waterworks has incurred a lead and copper monitoring violation because they failed to submit the required 20 tap samples during the prescribed June through September, 2009 monitoring period. A Notice of Violation must be issued for failure to submit the required number of samples and Anytown must complete the required Public Notification (this is a Tier III violation requiring public notification within 12 months).

III The Anytown waterworks is required to conduct their next round of lead and copper tap monitoring during the June through September 2010 monitoring period (this is the next available reduced monitoring period). As soon as these results are received, enter the SOX enforcement action into SDWIS to close out the monitoring violation. Assuming that the 90$^{th}$ percentile lead and copper concentrations of this monitoring are below the respective Action Levels, Anytown can resume triennial reduced monitoring. The next required monitoring would be no later than three calendar years from 2010 or during the June through September 2013 period. Also, note that the LCR STR clarifies that lead and copper samples must be collected during the same year. Anytown cannot collect 15 samples in 2010 and five samples in 2012 and be in compliance with the lead and copper monitoring requirements.

IV The Anytown waterworks must complete the public education customer notification requirements within 30 days of receiving the lead and copper results. ODW will consider the 30 day period to begin with the date of our lead and copper result transmittal letter. Certification that customer notification has been completed must be mailed to ODW within three months following the end of the monitoring period or no later than December 30, 2009.

## LCR Monitoring Example 3: Community Waterworks w/ Lead Action Level Exceedance

Assume that the 90th percentile lead concentration for Anytown in LCR Monitoring Example 2 was calculated to be 18 ppb. In this situation, the lead Action Level has been exceeded and Anytown must take the following actions:

1. The Anytown waterworks has incurred a lead and copper monitoring violation because they failed to submit the required 20 tap samples during the prescribed June through September, 2009 monitoring period. A Notice of Violation must be issued for failure to submit the required number of samples and Anytown must complete the required Public Notification (this is a Tier III violation requiring public notification within 12 months).

2. The Anytown waterworks must complete the public education customer notification requirements within 30 days of receiving the lead and copper results. ODW will consider the 30 day period to begin with the date of our lead and copper result transmittal letter. Certification that customer notification has been completed must be mailed to ODW within three months following the end of the monitoring period (no later than December 30).

3. Anytown must submit an optimal corrosion control treatment recommendation within 6 months following the end of the monitoring period (September 30) or no later than March 31, 2010.

4. Anytown must conduct WQP monitoring within 6 months calculated from the beginning of the lead and copper monitoring period. For waterworks in reduced monitoring, the 4 month lead and copper monitoring period is normally June through September. In this situation, the WQP monitoring must be completed no later than six months from June 1, 2009 or by November 30, 2009. NOTE THAT THIS IS A CHANGE FROM PREVIOUS TIMING OF WQP MONITORING REQUIRMENTS.

5. Anytown must conduct source water monitoring within 6 months (calculated from the end of the 4 month lead and copper monitoring period) and submit a source water treatment recommendation. The 4 month lead and copper monitoring period is normally June through September. In this situation, the WQP monitoring must be completed no later than six months from September 30, 2009 or by March 31, 2010. Source water samples must be collected from each entry point. As an alternative to collecting LCR specific source water samples you can use the results of routine metals samples if the results are less than one year old.

6. Anytown must complete all of the Public Education tasks within 60 days of the end of the lead and copper monitoring period (September 30, 2009) or no later than November 30, 2009.

7. Anytown does not have any lead pipe or lead service lines so the LSL replacement treatment technique does not apply.

8. Anytown is not required to continue lead and copper tap monitoring while OCCT is being evaluated and installed. However, we should strongly recommend that tap monitoring continue on a 6-month frequency and at the initial monitoring number of sites. If monitoring results are below the Action Levels public education can stop and OCCT will not have to be installed.

## LCR Monitoring Example 4: Community Waterworks w/ Copper Action Level Exceedance

Assume that the 90th percentile lead concentration for Anytown in LCR Monitoring Example 2 was determined to be 12 ppb but the 90th percentile copper concentration was calculated to be 1.7 mg/L. In this situation, the lead 90th percentile is below the Action Level but the copper Action Level (1.3 mg/L) has been exceeded and Anytown must take the following actions:

1. The Anytown waterworks has incurred a lead and copper monitoring violation because they failed to submit the required 20 tap samples during the prescribed June through September, 2009 monitoring period. A Notice of Violation must be issued for failure to submit the required number of samples and Anytown must complete the required Public Notification (this is a Tier III violation requiring public notification within 12 months).

2. The Anytown waterworks must complete the public education customer notification requirements within 30 days of receiving the lead and copper results. ODW will consider the 30 day period to begin with the date of our lead and copper result transmittal letter. Certification that customer notification has been completed must be mailed to ODW within three months following the end of the monitoring period (no later than December 30).

3. Anytown must submit an optimal corrosion control treatment recommendation within 6 months following the end of the monitoring period (September 30) or no later than March 31, 2010.

4. Anytown must conduct WQP monitoring within 6 months calculated from the beginning of the lead and copper monitoring period. For waterworks in reduced monitoring, the 4 month lead and copper monitoring period is normally June through September. In this situation, the WQP monitoring must be completed no later than six months from June 1, 2009 or by November 30, 2010. NOTE THAT THIS IS A CHANGE FROM PREVIOUS TIMING OF WQP MONITORING REQUIRMENTS.

5. Anytown must conduct source water monitoring within 6 months (calculated from the end of the 4 month lead and copper monitoring period) and submit a source water treatment recommendation. The 4 month lead and copper monitoring period is normally June through September. In this situation, the WQP monitoring must be completed no later than six months from September 30, 2009 or by March 31, 2010. Source water samples must be collected from each entry point. As an alternative to collecting LCR specific source water samples you can use the results of routine metals samples if the results are less than one year old.

6. Anytown is not required to continue lead and copper tap monitoring while OCCT is being evaluated and installed. However, we should strongly recommend that tap monitoring continue on a 6-month frequency and at the initial monitoring number of sites. If monitoring results are below the Action Levels OCCT will not have to be installed.

**LCR Monitoring Example 5: Community Waterworks w/ High Lead Results**

As noted in Monitoring Example 2 above, Anytown submitted 10 lead and copper samples that were collected on October 2, 2009. Per EPA guidance, these samples cannot be used in the 90th percentile calculation because they were collected outside of the prescribed June through September monitoring period. The reason for this policy is that it is presumed that lead corrosion will be higher during warm water conditions, so samples collected outside of the June through September period will not represent the highest risk situation.

But suppose that some of the results of those 10 samples indicate elevated lead levels. Even though we cannot include these samples in the 90th percentile calculation, the ODW will not ignore elevated lead levels and the resulting potential public health implications.

These situations will be handled on a case-by-case basis and in consultation with the Division of Technical Services staff in the Central Office. In this Anytown example, the most likely course of action would be to elevate the monitoring violation to Tier 2 and require public notification within 30 days. The public notice could include the lead Public Education written text. We may also consider requiring Anytown to return to initial monitoring.

**LCR Monitoring Example 6: Waterworks Making a Long-Term Treatment Change**

The Anytown water treatment plant utilizes a zinc orthophosphate inhibitor as the corrosion control treatment. Because of a new zinc effluent limit at the wastewater treatment plant, Anytown decides to change corrosion inhibitor chemicals to orthophosphate. Anytown submits plans and specifications to the District Engineer for the change in inhibitor chemical and the Field Office issues an approval and construction permit. Because Anytown is making a long term treatment change that *may adversely impact* distribution system lead levels, the District Engineer must require that Anytown conduct an OCCT study and/or conduct additional lead and copper tap monitoring. This action is necessary to ensure that the long term treatment change will not result in elevated lead levels at consumer's taps. The District Engineer consults with the Division of Technical Services staff in the Central Office and the decision is made to require Anytown to conduct additional lead and copper tap monitoring after making the change to the orthophosphate inhibitor.

Because Anytown is changing the method of corrosion control treatment, the owner is are required to collect 40 samples (the original number of lead and copper samples) during each of two consecutive 6-month periods from previously approved sampling locations (See *Waterworks Regulations* 12VAC5-590-370 B 6 a (4) (b)). The results of this monitoring will be evaluated and compared to historical monitoring results.

Assume that the results of Anytown's additional monitoring indicate lead and copper concentrations are below the respective Action Levels. In fact, the results indicate virtually no change in lead or copper concentrations from previous monitoring that was conducted when zinc orthophosphate was being used for corrosion control.

The additional monitoring results for Anytown have demonstrated that the change to orthophosphate resulted in no adverse impacts on distribution system lead levels. In this situation there is no reason that Anytown can not immediately return to triennial reduced monitoring.

END OF MEMO